

REMARKS

Claims 1-63 are pending. By this Amendment, claims 1-4, 6-22, 24-56, 58, 60 and 62 are amended. The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

The claims have been amended to improve their grammar and to change "step for" to "step of" so that the claims are not construed as step-plus-function claims in accordance with 35 U.S.C. §112, sixth paragraph. In addition, claims 2 and 50 are amended to address the rejection under 35 U.S.C. §112, second paragraph.

Claims 2, 12-24 and 50-55 stand rejected under 35 U.S.C. §112, second paragraph. In particular, the Office Action objects to wording in claims 2 and 50. This rejection is respectfully traversed.

Applicants submit that the amendment to claim 2 provides antecedent basis for the feature that degradation of the optical characteristic of the projection system remains after the first adjusting step. Regarding claim 50, Applicants respectfully submit that one having ordinary skill in the art would understand what is claimed, i.e., "adjusting an illumination characteristic by which said reticle is illuminated" in accordance with a step that improves an "optical performance" of a projection system, particularly after having read the specification. See, e.g., page 82, line 8 - page 90, line 11. Accordingly, withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is requested.

Claims 1-63 stand rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,105,075 to Ohta et al. This rejection is respectfully traversed.

Ohta et al. discloses that symmetrical distortion aberration and magnification of a projection optical system can be corrected by moving one of a plurality of lenses within the projection optical system in an optical axis direction and by moving the reticle in an optical

axis direction. See, for example, col. 3, lines 34-47. Ohta et al. does not disclose or suggest many of the features recited in the independent claims of this application.

For example, Ohta et al. does not disclose or suggest the step of setting or inserting a correction member that corrects residual aberration in a projection system between the reticle and substrate setting positions as recited in independent claims 1, 25, 56, 58 and 60, respectively. Ohta et al. merely moves a lens of the projection optical system; it does not set (i.e., place) or insert a correction member that corrects residual aberration in the projection system between the reticle and substrate setting positions.

In addition, Ohta et al. does not disclose or suggest processing a correction member based on measured residual aberration as recited in independent claims 25 and 60. Moving a lens does not correspond to processing a correction member.

In addition, while Ohta et al. discloses moving a lens and/or moving a reticle, Ohta et al. does not disclose or suggest moving a reticle or substrate in order to correct degradation of optical characteristics of a projection system caused by setting or inserting a correction member between the reticle and substrate setting positions as recited in independent claims 1, 25, 56, 58 and 60.

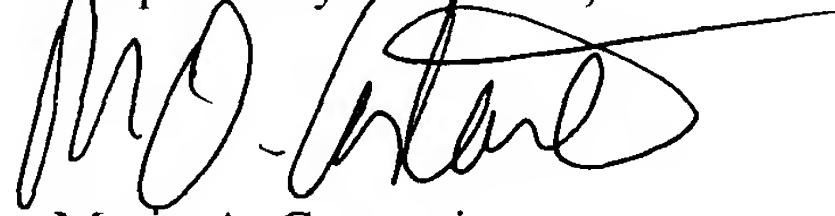
In addition, Ohta et al. does not disclose or suggest the step of adjusting the illumination characteristic by which the reticle is illuminated, in accordance with an improving step of improving the optical characteristic of the projection system based on a measurement result obtained by a measuring step as recited in independent claims 50 and 62.

Accordingly, all independent claims and their dependent claims are patentable over Ohta et al.

In view of the foregoing, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number set forth below.

Respectfully submitted,



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MAC/ccs

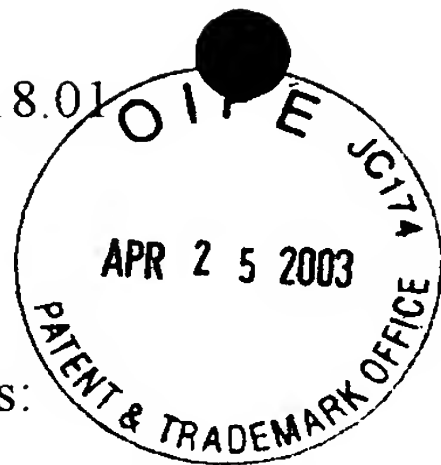
Attachments:

Appendix  
Petition for Extension of Time

Date: April 25, 2003

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<p><b>DEPOSIT ACCOUNT USE AUTHORIZATION</b> Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>
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## APPENDIX

## Changes to Claims:

The following is a marked-up version of the amended claim(s):

1.     (Twice Amended) A method for manufacturing an exposure apparatus comprising the steps of:
  - a providing step ~~for~~of providing a projection system ~~projecting that projects~~ and ~~exposing~~exposes an image of a predetermined pattern formed on a reticle to a photosensitive substrate;
  - a setting step ~~for~~of setting a correction member ~~correcting that corrects~~ residual aberration in said projection system at a predetermined position in an optical path between a reticle setting position where said reticle is set and a substrate setting position where said photosensitive substrate is set; and
  - a correcting step ~~for~~of correcting degradation of optical characteristic of said projection system caused by setting said correction member at said predetermined position; wherein said correcting step includes a first adjusting step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position.
2.     (Amended) The method for manufacturing an exposure apparatus according to claim 1, wherein the first adjusting step does not correct all of the degradation of said optical characteristic, and wherein said correcting step further includes a second adjusting step ~~for~~of adjusting said projection system ~~for correcting to correct the~~ degradation of said optical characteristic ~~unable to be~~that is not corrected by said first adjusting step.
3.     (Twice Amended) The method for manufacturing an exposure apparatus according to claim 1, wherein said correcting step further includes a first calculating step, prior to said setting step, ~~for~~of calculating an adjusting amount of at least one of said reticle setting position and said substrate setting position in order to correct said degradation of

optical characteristic produced in accordance with the thickness of said correction member;  
and

said first adjusting step includes a step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position based on a first calculated information obtained in said first calculating step.

4. (Amended) The method for manufacturing an exposure apparatus according to claim 1, and further comprising:

a support member arranging step, prior to said setting step, ~~for~~of arranging a support member supporting said correction member in order to set said correction member at said predetermined position.

6. (Amended) The method for manufacturing an exposure apparatus according to claim 1; wherein said first adjusting step includes a step ~~for~~of moving at least one of a reticle stage ~~for setting~~that sets said reticle to said reticle setting position and a substrate stage ~~for setting~~that sets said photosensitive substrate to said substrate setting position.

7. (Amended) ~~The~~ A method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 1;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

8. (Amended) A method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 3;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

9. (Amended) A method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 4;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

10. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 5;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

11. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 6;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and



a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

12. (Amended) The method for manufacturing an exposure apparatus according to claim 2;

wherein said correcting step further includes a first calculating step, prior to said setting step, ~~for~~of calculating an adjusting amount of at least one of said reticle setting position and said substrate setting position in order to correct degradation of said optical characteristic produced in accordance with the thickness of said correction member, and;

said first adjusting step includes a step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position based on first calculated information obtained in said first calculating step.

13. (Amended) The method for manufacturing an exposure apparatus according to claim 2;

wherein said correcting step further includes a second calculating step, prior to said setting step, ~~for~~of calculating an adjusting amount of said projection system so as to correct degradation of said optical characteristic unable to be corrected by said first adjusting step; and

said second adjusting step includes a step ~~for~~of adjusting said projection system based on second calculated information obtained in said second calculating step.

14. (Amended) The method for manufacturing an exposure apparatus according to claim 13; wherein said second adjusting step includes a step ~~for~~of adjusting at least one optical member of said projection system.

15. (Amended) The method for manufacturing an exposure apparatus according to claim 2; wherein said second adjusting step includes a step ~~for~~of adjusting at least one member of said projection optical system.



16. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~ of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 2;

a reticle setting step ~~for~~ of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~ of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~ of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~ of developing said photosensitive substrate exposed by said exposing step.

17. (Amended) The method for manufacturing an exposure apparatus according to claim 12; wherein said correcting step further includes a second calculating step, prior to said setting step, ~~for~~ of calculating an adjusting amount of said projection system so as to correct degradation of said optical characteristic unable to be corrected by said first adjusting step; and

said second adjusting step includes a step ~~for~~ of adjusting said projection system based on second calculated information obtained in said second calculating step.

18. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~ of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 12;

a reticle setting step ~~for~~ of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

19. (Amended) The method for manufacturing an exposure apparatus according to claim 17; wherein said second adjusting step includes a step ~~for~~of adjusting at least one optical member of said projection system.

20. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 17;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

21. (Amended) The method for manufacturing an exposure apparatus according to claim 19, ~~and further comprising~~;

a support member arranging step, prior to said setting step, ~~for~~of arranging a support member supporting said correction member in order to set said correction member at said predetermined position.

22. (Amended) ~~The~~A method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 19;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

24. (Amended) The method for manufacturing an exposure apparatus according to claim 23; wherein said first adjusting step further includes a step ~~for~~of moving at least one of a reticle stage ~~for setting that sets~~ said reticle to said reticle setting position and a substrate stage ~~for setting that sets~~ said photosensitive substrate to said substrate setting position.

25. (Twice Amended) A method for manufacturing an exposure apparatus comprising ~~the steps of~~:

a providing step ~~for~~of providing a projection system ~~projecting that projects~~ and ~~exposing~~exposes an image of a predetermined pattern formed on a reticle to a photosensitive substrate;

a measuring step ~~for~~of measuring residual aberration in said projection system;

a processing step ~~for~~of processing a correction member ~~for correcting that~~corrects said residual aberration in said projection system based on measured information obtained in said measuring step;

an inserting step ~~for~~of inserting a correction member obtained in said processing step at a predetermined position in an optical path between a reticle setting position where said reticle is set and a substrate setting position where said photosensitive substrate is set; and

a first adjusting step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position in accordance with a change in an object-to-image distance of said projection system produced by inserting said correction member.

26. (Amended) The method for manufacturing an exposure apparatus according to claim 25, ~~and further comprising;~~;

a second adjusting step ~~for~~of adjusting said projection system so as to correct degradation of optical characteristic of said projection system produced by inserting said correction member in said inserting step.

27. (Amended) The method for manufacturing an exposure apparatus according to claim 25, ~~and further comprising;~~;

a first calculating step, prior to said measuring step, said processing step and said inserting step, ~~for~~of calculating an amount of change in an object-to-image distance of said projection system produced by inserting said correction member;

wherein said first adjusting step includes a step, prior to said measuring step, said processing step and said inserting step, ~~for~~of adjusting at least one of said reticle setting

position and said substrate setting position based on first calculated information obtained in said first calculating step.

28. (Amended) The method for manufacturing an exposure apparatus according to claim 25, ~~and further comprising:~~

a first calculating step, independent from said measuring step, said processing step and said inserting step, ~~for~~of calculating an amount of change in an object-to-image distance of said projection system produced by inserting said correction member;

wherein said first adjusting step includes a step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position based on first calculated information obtained by said first calculating step.

29. (Amended) The method for manufacturing an exposure apparatus according to claim 25, ~~and further comprising:~~

a support member arranging step, prior to said measuring step, ~~for~~of arranging a support member supporting said correction member in order to set said correction member at said predetermined position.

30. (Amended) The method for manufacturing an exposure apparatus according to claim 25; wherein said first adjusting step includes a step ~~for~~of moving at least one of a reticle stage for setting said reticle to said reticle setting position and a substrate stage for setting said photosensitive substrate to said substrate arranging position.

31. (Amended) ~~The~~ A method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 25;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

32. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 27;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

33. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 28;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

34. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 29;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

35. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 30;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;



a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus predetermine in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

36. (Amended) The method for manufacturing an exposure apparatus according to claim 26, ~~and~~ further comprising;

a first calculating step, prior to said measuring step, said processing step and said inserting step, ~~for~~of calculating an amount of change in an object-to-image distance of said projection system produced by inserting said correction member;

wherein said first adjusting step includes a step, prior to said measuring step, said processing step and said inserting step, ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position based on first calculated information obtained in said first calculating step.

37. (Amended) The method for manufacturing an exposure apparatus according to claim 26, ~~and~~ further comprising;

a second calculating step, prior to said measuring step, said processing step and said inserting step, ~~for~~of calculating an amount of adjustment for said projection system for correcting degradation of optical characteristic of said projection system produced by inserting said correction member;

wherein said second adjusting step includes a step, prior to said measuring step, said processing step and said inserting step, ~~for~~of adjusting said projection system based on second calculated information obtained in said second calculating step.

38. (Amended) The method for manufacturing an exposure apparatus according to claim 26, ~~and further comprising:~~

a first calculating step, independent from said measuring step, said processing step and said inserting step, ~~for~~of calculating an amount of change in an object-to-image distance of said projection system produced by inserting said correction member;

wherein said first adjusting step includes a step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position based on first calculated information obtained in said first calculating step.

39. (Amended) The method for manufacturing an exposure apparatus according to claim 38, ~~and further comprising:~~

a second calculating step, independent from said measuring step, said processing step and said inserting step, ~~for~~of calculating an amount of adjustment for said projection system so as to correct degradation of optical characteristic of said projection system produced by inserting said correction member;

wherein said second adjusting step includes a step ~~for~~of adjusting said projection system based on second calculated information obtained in said second calculating step.

40. (Amended) ~~The~~ A method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 39;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

41. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 26;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

42. (Amended) The method for manufacturing an exposure apparatus according to claim 25, wherein said measuring step includes ~~;~~:

a step ~~for~~of measuring residual aberration in said projection system in a state in which an optical member exclusively for measurement having same optical thickness as said correction member is inserted ~~at on~~into said predetermined position.

43. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 42;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

44. (Amended) The method for manufacturing an exposure apparatus according to claim 25, wherein said measuring step includes; ~~;~~;

a step ~~for~~of measuring residual aberration of said projection system in a state in which an unprocessed correction member in said processing step is being inserted into said predetermined position.

45. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 44;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

46. (Amended) The method for manufacturing an exposure apparatus according to claim 36, ~~and further comprising:~~

a second calculating step, prior to said measuring step, said processing step and said inserting step, ~~for~~of calculating an amount of adjustment with respect to said projection system so as to correct degradation of optical characteristic of said projection system produced by inserting said correction member;

wherein said second adjusting step includes a step, prior to said measuring step, said processing step and said inserting step, ~~for~~of adjusting said projection system based on second calculated information obtained in said second calculating step.

47. (Amended) The method for manufacturing an exposure apparatus according to claim 46, wherein said measuring step includes:

a step ~~for~~of measuring residual aberration in said projection system in a state in which an optical member exclusively for measurement having same optical thickness as said correction member is inserted into said predetermined position.

48. (Amended) The method for manufacturing an exposure apparatus according to claim 46, wherein said measuring step includes:

a step ~~for~~of measuring residual aberration in said projection system in a state in which an unprocessed correction member in said processing step is being inserted into said predetermined position.

49. (Amended) ~~The~~A method for manufacturing a micro device comprising ~~the steps of:~~

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 46;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;  
a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;  
an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and  
a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

50. (Amended) A method for manufacturing an exposure apparatus comprising-  
~~the steps of:~~

a measuring step ~~for~~of measuring optical ~~capability~~performance of a projection system ~~projecting that projects~~ and ~~exposing~~exposes an image of a predetermined pattern formed on a reticle to a photosensitive substrate;

an improving step ~~for~~of improving the optical capability~~performance~~ of said projection system based on measurement result by said measuring step; and

an adjusting step ~~for~~of adjusting an illumination characteristic ~~for illuminating~~  
by which said reticle is illuminated in accordance with said improving step.

51. (Amended) The method for manufacturing an exposure apparatus according to claim 50, wherein said improving step includes;:-

an arranging step ~~for~~of arranging a processed correction member based on measurement result in said measuring step in order to correct residual aberration in said projection system.

52. (Amended) The method for manufacturing an exposure apparatus according to claim 50, wherein said improving step includes;:-

a step ~~for~~of processing at least one optical member in said projection system based on measured result by said measuring step in order to correct residual aberration in said projection system.

53. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 50;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

54. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 51;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and



a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

55. (Amended) ~~The A~~ method for manufacturing a micro device comprising ~~the steps of~~:

a preparing step ~~for~~of preparing an exposure apparatus manufactured by using the method for manufacturing an exposure apparatus according to claim 52;

a reticle setting step ~~for~~of setting a reticle at said reticle setting position;

a substrate setting step ~~for~~of setting a photosensitive substrate at said substrate setting position;

an exposing step ~~for~~of exposing a pattern image of said reticle to said photosensitive substrate by using a projection system of an exposure apparatus prepared in said preparing step; and

a developing step ~~for~~of developing said photosensitive substrate exposed by said exposing step.

56. (Amended) A method for manufacturing an exposure apparatus, comprising ~~the steps of~~:

a first providing step ~~for~~of providing a projection system ~~projecting that projects and exposing~~exposes an image of a predetermined pattern formed on a reticle onto a photosensitive substrate;

a second providing step ~~for~~of providing a correction member ~~correcting that corrects~~ residual aberration in said projection system;

a setting step ~~for~~of setting said correction member at a predetermined position in an optical path between a reticle setting position where said reticle is set and a substrate setting position where said photosensitive substrate is set; and

a correcting step ~~for~~of correcting degradation of optical characteristic of said projection system caused by setting said correction member at said predetermined position;

wherein said correcting step includes a first adjusting step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position.

58. (Amended) A process for improving an optical characteristic of a projection system for projecting and exposing an image of a predetermined pattern formed on a reticle onto a photosensitive substrate, comprising ~~the steps of~~:

a providing step ~~for~~of providing a correction member ~~correcting that corrects~~ residual aberration in said projection system;

a setting step ~~for~~of setting said correction member at a predetermined position in an optical path between a reticle setting position where said reticle is set and a substrate setting position where said photosensitive substrate is set; and

a correcting step ~~for~~of correcting degradation of optical characteristic of said projection system caused by setting said correction member at said predetermined position;

wherein said correcting step includes a first adjusting step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position.

60. (Amended) A process for improving an optical characteristic of a projection system for projecting and exposing an image of a predetermined pattern formed on a reticle onto a photosensitive substrate, comprising ~~the steps of~~:

a measuring step ~~for~~of measuring residual aberration in said projection system;

a processing step ~~for~~of processing a correction member ~~for correcting that~~ corrects said residual aberration in said projection system based on measured information obtained in said measuring step;

an inserting step ~~for~~of inserting the correction member obtained in said processing step at a predetermined position in an optical path between a reticle setting position where said reticle is set and a substrate setting position where said photosensitive substrate is set; and

a first adjusting step ~~for~~of adjusting at least one of said reticle setting position and said substrate setting position in accordance with a change in an object-to-image distance of said projection system produced by inserting said correction member.

62. (Amended) A process for improving an optical characteristic of a projection system for an exposure apparatus, comprising ~~the steps of~~:

a measuring step ~~for~~of measuring the optical characteristic of the projection system ~~projecting and exposing~~that projects and exposes an image of a predetermined pattern formed on a reticle onto a photosensitive substrate;

an improving step ~~for~~of improving the optical characteristic of said projection system based on a measurement result obtained by said measuring step; and

an adjusting step ~~for~~of adjusting an illumination characteristic ~~for~~illuminating by which said reticle is illuminated in accordance with said improving step.